

IV. DISCONTINUED RESIDENTIAL PROGRAMS

BLANKET SEATTLE / WATER HEATER INSULATION AND SETBACK

Description

From 1977 to mid-1981, City Light Appliance Service staff completed 6,054 R-5 tank wraps and thermostat setbacks. From late 1981-1983, City Light's *Blanket Seattle* program provided 107,459 free R-10 tank wraps and temperature setbacks to a maximum of 140° F; the program was sponsored by the BPA. From 1984 through 1992, water heater conservation measures were provided through the *HEC* program.

Eligible Population

This program served residential customers with electric water heaters.

Lifetime of Conservation Measures Installed: 10 years

Electricity Savings

The average home receiving hot water conservation measures under the Blanket Seattle Program saved about 350 kilowatt-hours (kWh) per year. These savings represented three percent (3%) of the typical electricity use in a single-family home with electric water heat (14,139 kWh in 1990).

Between 1977 and 1992, the Blanket Seattle Program saved a total of 313,652 megawatt-hours (MWh). Since the lifetime of these measures has expired, this program did not deliver any savings in 2004.

BLANKET SEATTLE / WATER HEATER INSULATION AND SETBACK**ELECTRICITY SAVINGS FROM WATER HEATER INSULATION PROGRAM**

Year	Participants By Year (1)	Cumulative Participants	kWh Savings per Participant (2)	MWh Savings in Year (3)	Avg. MW Load Reduction in Year
1977	232	232	500	116	0.013
1978	194	426	500	213	0.024
1979	1,430	1,856	500	928	0.106
1980	3,173	5,029	500	2,515	0.287
1981	1,758	6,787	500	3,481	0.397
1982	67,454	74,241	450	33,408	3.814
1983	39,272	113,513	350	39,730	4.535
1984	0	113,513	250	28,378	3.240
1985	0	113,513	250	28,378	3.240
1986	0	113,513	250	28,378	3.240
1987	0	113,513	250	28,320	3.233
1988	0	113,513	250	28,272	3.227
1989	0	113,513	250	27,914	3.187
1990	0	113,513	250	27,121	3.096
1991	0	113,513	250	26,682	3.046
1992	0	113,513	250	9,818	1.121
1993-2004	0	113,513	250	0	0.000
Electricity Savings Since Start of Program:				313,652	MWh

Program Expenditures

Expenditures from 1977 through 1980 were not tracked. However, program expenditures from 1981 through 1983 for administration and the installation of measures totaled \$4,076,339. This represents the cost to the utility, and not the total resource cost. The Bonneville Power Administration provided \$3,664,482 in funding during this three-year period.

BLANKET SEATTLE / WATER HEATER INSULATION AND SETBACK**PROGRAM EXPENDITURES FOR WATER HEATER INSULATION PROGRAMS (4)**

Year	Administration	Measure Installation	Expenditures
1977	—	—	—
1978	—	—	—
1979	—	—	—
1980	—	—	—
1981	\$121,493	\$1,139,970	\$1,261,463
1982	313,711	2,363,578	2,677,289
1983	137,587	0	137,587
1984-2004	0	0	0
TOTAL	\$572,791	\$3,503,548	\$4,076,339

BPA FUNDING FOR WATER HEATER INSULATION (5)

Year	BPA Funding
1977	\$0
1978	0
1979	0
1980	0
1981	50,762
1982	2,273,465
1983	1,340,255
1984-2004	0
TOTAL	\$3,664,482

Notes

- Participant figures exclude customers who received tank wraps through the *HEC* program, *HELP*, and *LIEP*. Data are from “Seattle City Light Residential Conservation Totals: Conserved Electricity from 1976-1982” (June 1983) and “Tank Wrap Installations Under the Blanket Seattle Program” (May 1985).
- Program savings from 1977-1980 were estimated to be 500 kWh per year (for R-5 tank wraps) based on information in the *Evaluation of the Home Energy Check Program* (November 1981). In 1981, R-10 wraps were installed through the Blanket Seattle program; the savings were estimated to be 600 kWh per year. However, the *Evaluation of the Water Heater Rebate Program* (1985) revealed that the actual annual savings for tank wraps ranged between 200 kWh and 300 kWh per home. Thus, the savings since 1981 have been scaled down to be consistent with the new energy savings estimates; savings were set at 450 kWh in 1982, 350 kWh in 1983, and 250 kWh in 1984 through 1991. Because the reduction in savings appeared to be due to rate increases and other customer lifestyle changes, the savings from all wraps were decreased in successive years, regardless of the year of installation.

BLANKET SEATTLE / WATER HEATER INSULATION AND SETBACK

3. After 1983 the program was discontinued so the later savings shown represent continuing savings from earlier program participants only. Savings by year declined starting in 1987, due to the lifetime of measures installed ten years previously having been reached. Savings are calculated for 113,281 customers in 1987, 113,087 customers in 1988, and 111,657 customers in 1989, and 108,484 customers in 1990, 106,726 customers in 1991, and 39,272 customers in 1992. The lifetime of all measures has expired by 1993.

First year energy savings from new participants completing work in each year were: 116 MWh (1977); 97 MWh (1978); 715 MWh (1979); 1,587 MWh (1980); 967 MWh (1981); 30,354 MWh (1982); and 13,745 MWh (1983).

4. Expenditures for water heater wraps and thermostat setbacks for 1977-1980 were not available (not tracked as a separate work activity). The 1981-1982 figures are from City Light MIS reports for Work Order No. 70571. The 1983 administration cost data are from the Conservation Data Base, EMSD. The 1983 measure costs were inadvertently charged to the *HELP* and cannot be accurately recovered.

Expenditures tracked on City Light MIS reports for 1984-1990 under Work Order No. 70571-02 (including Budget Items 9, 11, 12, and 21), and on Seattle Financial Management System reports for 1991 and 1992, are assigned to the Home Energy Check Program.

5. The BPA funding figures are from the BPA Short-Term Contract Final Report.

ENERGY EFFICIENT WATER HEATER REBATE PROGRAM

Description

Begun in March 1992, the Energy Efficient Water Heater Rebate Program (*EEWHRP*) was operated in conjunction with the Bonneville Power Administration (BPA) through the Residential Conservation Agreement. Funding provided by the BPA via the Third Party Financing Agreement began in June 1994 and ended in 1996.

The purpose of *EEWHRP* rebates was to increase the installation of energy efficient electric water heaters during normal replacement. The BPA provided a \$60 rebate per qualifying installed water heater; in 1995 the rebate was reduced to \$30. The water heater must have an energy factor of 0.93 for tanks of 59 gallons or less, and 0.91 for tanks of 60 gallons or more (these values exceed current federal standards). While the BPA sent rebate checks directly to customers, Seattle City Light was responsible for marketing the program to customers and dealer participants, for database management and quality control. With the end of BPA participation, Seattle City Light operated and funded the \$30 rebate program in 1996 through mid-2002, at which time *EEWHRP* was discontinued. The rebates ended because new federal efficiency standards go into effect in January 2004, requiring that electric water heaters be as efficient as those formerly required by *EEWHRP*.

City Light conducted the preceding Water Heater Rebate Program (*WHRP*) between 1983 and 1990 to promote installation of replacement water heaters that exceeded pre-1990 federal efficiency standards. For a description of *WHRP*, see the *Water Heater Rebate Program* in SECTION IV: DISCONTINUED RESIDENTIAL PROGRAMS.

Eligible Population

This program served the 316,758 utility customers residing in single-family homes, multiplexes, mobile homes, condominiums, and multifamily apartment buildings (including common area laundry rooms) within the Seattle City Light service area. A total population of 698,800 lives in Seattle City Light's 131 square mile service area. In 1994 the program began to serve Seattle's 30,839 commercial customers, as well, for replacement water heaters less than 120 gallons in size. (1)

ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**Lifetime of Conservation Measures Installed:** 12 years**Electricity Savings**

The average single-family residence that participated in *EEWHRP* saves about 280 kilowatt-hours (kWh) per year. This represents one percent (1%) of the typical electrically-heated home's energy use (19,580 kWh in 1990); or two percent (2%) of electricity use in single-family homes heated by gas, oil, or another fuel (10,769 kWh in 1990). Over the past decade, single-family household electrical use has been declining; in 1998, the average home used 10-15% less than in 1990.

The average multiplex (two to four unit) or multifamily (five or more units) residence that participated in *EEWHRP* saves about 145 kWh per year. This represents two percent (2%) of the typical electrically-heated unit's energy use (8,938 kWh in 1990); or three percent (3%) of electricity use in a unit heated by gas, oil or another fuel (5,417 kWh in 1990).

The average small commercial business that participated in *EEWHRP* also saves about 145 kWh per year.

Since 1992, *EEWHRP* has saved a total of 103,905 megawatt-hours (MWh). Energy savings in 2004 from cumulative (1992-2002) participants were 10,391 MWh. The load reduction in 2004 due to this program was 1.186 average megawatts (aMW).

ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**ELECTRICITY SAVINGS FOR THE
ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**

Year	Buildings by Year	Partici- pants by Year (1)	Cumulative Participants	kWh Savings per Participant (2)	MWh Savings in Year (2)	Avg. MW Load Reduction in Year
1992	Single Family	3,512	3,512	280	983	0.112
	Multifamily	1,124	1,124	145	163	0.019
	Annual Total	4,636	4,636	—	1,146	0.131
1993	Single Family	5,594	9,106	280	2,550	0.291
	Multifamily	2,069	3,193	145	463	0.053
	Annual Total	7,663	12,299	—	3,013	0.344
1994	Single Family	5,245	14,351	280	4,018	0.459
	Multifamily	2,462	5,655	145	820	0.094
	Small Comrcl	31	31	145	4	0.001
	Annual Total	7,738	20,037	—	4,843	0.553
1995	Single Family	4,347	18,698	280	5,235	0.598
	Multiplex	385	385	145	56	0.006
	Multifamily	1,947	7,602	145	1,102	0.126
	Small Comrcl	83	114	145	17	0.002
	Annual Total	6,762	26,799	—	6,410	0.732
1996	Single Family	2,604	21,302	280	5,965	0.681
	Multiplex	375	760	145	110	0.013
	Multifamily	1,254	8,856	145	1,284	0.147
	Small Comrcl	56	170	145	25	0.003
	Annual Total	4,289	31,088	—	7,384	0.843
1997	Single Family	1,559	22,861	280	6,401	0.731
	Multiplex	213	973	145	141	0.016
	Multifamily	844	9,700	145	1,407	0.161
	Small Comrcl	32	202	145	29	0.003
	Annual Total	2,648	33,736	—	7,978	0.911
1998	Single Family	2,191	25,052	280	7,015	0.801
	Multiplex	277	1,250	145	181	0.021
	Multifamily	822	10,522	145	1,526	0.174
	Small Comrcl	40	242	145	35	0.004
	Annual Total	3,330	37,066	—	8,757	1.000
1999	Single Family	2,029	27,081	280	7,583	0.866
	Multiplex	252	1,502	145	218	0.025
	Multifamily	1,168	11,690	145	1,695	0.193
	Small Comrcl	29	271	145	39	0.004
	Annual Total	3,478	40,544	—	9,535	1.088

(Cont'd.)

ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**ELECTRICITY SAVINGS FOR THE
ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**

(Continued)

Year	Buildings by Year	Partici- pants by Year (1)	Cumulative Participants	kWh Savings per Participant (2)	MWh Savings in Year (2)	Avg. MW Load Reduction in Year
2000	Single Family	1,900	28,981	280	8,115	0.926
	Multiplex	212	1,714	145	249	0.028
	Multifamily	1,285	12,975	145	1,881	0.215
	Small Comrcl	28	299	145	43	0.005
	Annual Total	3,425	43,969	—	10,288	1.174
2001	Single Family	2,057	31,038	280	8,691	0.992
	Multiplex	303	2,017	145	292	0.033
	Multifamily	1,183	14,158	145	2,053	0.234
	Small Comrcl	43	342	145	50	0.006
	Annual Total	3,586	47,555	—	11,086	1.265
2002	Single Family	1,141	32,179	280	9,010	1.029
	Multiplex	152	2,169	145	315	0.036
	Multifamily	736	14,894	145	2,160	0.247
	Small Comrcl	24	366	145	53	0.006
	Annual Total	2,053	49,608	—	11,537	1.317
2003	Annual Total	0	49,608	—	11,537	1.317
2004	Annual Total	0	49,608	—	10,391	1.186
Electricity Savings Since Start of Program:					103,905	MWh

Program Expenditures

From 1992 through mid-1996 the Bonneville Power Administration paid all rebates, in the amount of \$1,728,030, directly to the customers. The Seattle City Light portion (25% of rebates during 1992) was reimbursed to the BPA, amounting to \$69,540. This amount owed to the BPA in 1992 was credited against billings to the BPA under other programs included in the Residential Conservation Agreement; thus these rebate dollars do not appear in the City Light budget or cost accounting system as a measures cost.

In 1992-1995 the BPA funded a portion of City Light's administrative costs. The total Seattle City Light program expenditures in 1992-2002 were \$1,652,844. This represents the cost to the utility, and not the total resource cost.

ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**SEATTLE CITY LIGHT PROGRAM EXPENDITURES FOR
THE ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**

Year	Administration (3)	Measures (4)	Total Expenditures
1992	\$84,192	—	\$84,192
1993	149,874	360	150,234
1994	114,971	—	114,971
1995	93,238	3,720	96,958
1996	76,340	4,500	80,840
1997	97,927	79,440	177,367
1998	96,380	99,900	196,280
1999	94,149	104,340	198,489
2000	95,774	102,750	198,524
2001	106,950	107,580	214,530
2002	78,868	61,590	140,459
2003-2004	0	0	0
Total	\$1,088,663	\$564,180	\$1,652,844

**BPA FUNDING / REIMBURSEMENT TO SEATTLE CITY LIGHT
FOR THE ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**

Year	Administration (5)	Measures (6)	Total Funding
1992	\$49,190	\$ – 69,540	\$ – 20,350
1993	93,053	0	93,053
1994	62,283	0	62,283
1995	19,440	0	19,440
1996	– 780	0	– 780
1997-2004	0	0	0
Total	\$223,226	\$ – 69,540	\$153,686

ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**BPA DIRECT PAYMENTS TO SEATTLE CITY LIGHT CUSTOMERS FOR THE
ENERGY EFFICIENT WATER HEATER REBATE PROGRAM**

Year	Expenditures (7)
1992	\$278,160
1993	459,420
1994	420,000
1995	446,280
1996	131,250
1997-2004	0
Total	\$1,735,110

Notes

1. The eligible population figures are from the *Seattle City Light 2000 Annual Report* and from the *Seattle City Light Customer Information Guide* (December 1999).

Participant figures include all rebates approved by City Light in 1992-1996, taken from Residential Conservation Agreement (RCA) monthly and year-end billings. Installation of rebated water heaters is verified by the BPA via a random selection process. Multifamily participants in 1992-1996 were identified by service address from Community Conservation Section records. Participants in 1997-2002 were identified from program databases and financial-system expenditure reports.
2. The energy savings per tank are based on projections of savings by the Program Development section. First year energy savings from new participants completing work in each year were: 1,146 MWh (1992); 1,866 MWh (1993); 1,830 MWh (1994); 1,567 MWh (1995); 973 MWh (1996); 594 MWh (1997); 779 MWh (1998); 778 MWh (1999); 753 MWh (2000); 798 MWh (2001); and 452 MWh (2002).
3. Cost data for 1991-2002 incorporate expenditures for administrative labor, office supplies, travel and printing. Cost data are from the Seattle Financial Management System and the Summit System for Work Order/Activity Nos. 70556 (1991-1997) and 70577 (1994-2002).

Administrative costs for 1993-2002 include an A&G overhead charge (begun in April 1993) for utility administrative and general expenses. This charge distributes departmental administrative and general expenses, including nonprogrammatic labor and expenses, to individual conservation programs in proportion to programmatic labor hours. In 1993 the A&G overhead charge for the *EEWHRP* was \$22,119, or 15% of total programmatic administrative expenditures; in 1994 it was \$18,945 (16%); in 1995 it was \$28,314 (29%).
4. The source of data on 1992 payments to the BPA by City Light for Seattle's 25% rebate cost-share is the Residential Energy Management Services Section, from RCA monthly and year-end billings. See Note 6 regarding measure costs. In 1993 City Light paid six rebates directly for water heaters installed in new construction projects participating in the Long Term Super Good Cents Program.
5. BPA funding was received for advertising, "Adcents" travel, and City Light's processing costs for rebate requests passed on in batches to the BPA. Rebates were allowed at \$5.00 per rebate and in

ENERGY EFFICIENT WATER HEATER REBATE PROGRAM

- 1992 were cost shared by City Light 25% and the BPA 75%. In 1993 the BPA paid 100% of these administrative costs for 7,663 rebates, while in 1994 the BPA paid administrative expenses for 7,241 rebates. Administrative expenses were claimed by City Light for only the 3,888 rebates processed by June 30, 1995. The data on administrative funding are based on City Light invoices submitted to BPA by calendar year. This amount reflects only BPA funding for City Light's administrative expenses and excludes BPA administrative costs.
6. BPA funding in 1992 for 4,636 water heater rebates was calculated from Seattle City Light rebate refund payments to BPA, based on the cost share agreement. The source is Residential Energy Management Services Section records on BPA billings for calendar year 1992. This amount appears in the table as a negative number because it was reimbursed by City Light to the BPA, rather than the reverse as in other jointly sponsored programs. The form this reimbursement took was as a credit against billings to the BPA for funding of other programs under the Residential Conservation Agreement between the two utilities.
 7. These rebate payments (number of participants x \$60) were made by the BPA directly to program customers. In 1993 the BPA paid 100% of the rebates for 7,657 water heaters while City Light paid six rebates directly. In 1994 the BPA paid 100% of the rebates for 7,000 water heaters, for 7,438 water heaters in 1995, and for 4,139 in 1996. Meanwhile City Light picked up the cost of rebates in 1995 and 1996 for water heaters in LTSGC projects not covered by the BPA contract. SCL paid 100% of remaining 1996 rebates and all rebates issued in 1997-2002. This represents the total measure cost for the program.

HOME ENERGY CHECK PROGRAM

Description

In-home conservation audits were provided free of charge to residential single-family and multiplex customers through the Home Energy Check (*HEC*) program. Seattle City Light conservation representatives audited both electrically heated residences and homes heated with other fuels. Detailed inspections allowed auditors to identify sources of energy loss and to recommend energy-saving and water-saving actions. They also began in 1989 to provide information about recycling and composting, and to distribute energy-efficient compact fluorescent lamps, efficient-flow showerheads, and water conservation kits. Auditors continued to install some hot water tank wraps and set back hot water tank thermostats. The program was discontinued in December 1992.

Eligible Population

This program served single-family and multiplex (2- to 4-unit) buildings.

Lifetime of Conservation Measures Installed: 10 years

Electricity Savings

The average single-family building that received a *HEC* audit and did not enter another program (*HELP* or *LIEP*) for weatherization financing saves about 430 kilowatt-hours (kWh) per year. This represents two percent (2%) of the typical electrically-heated home's energy use (19,580 kWh in 1990); or four percent (4%) of electricity use in single-family homes heated by gas, oil, or another fuel (10,769 kWh in 1990).

Between 1978 and 2001, the *HEC* program saved a total of 180,357 megawatt-hours (MWh). Since the lifetime of these measures has expired, this program did not deliver any savings in 2004.

HOME ENERGY CHECK PROGRAM**ELECTRICITY SAVINGS FOR THE HOME ENERGY CHECK PROGRAM**

Year	Buildings by Year (1)	Cumulative Buildings	kWh Savings per Building (2)	MWh Savings in Year (3)	Avg. MW Load Reduction in Year
1978	1,765	1,765	690	1,218	0.139
1979	4,894	6,659	690	4,595	0.525
1980	4,769	11,428	690	7,885	0.900
1981	5,739	17,167	460	10,525	1.202
1982	4,697	21,864	460	12,686	1.448
1983	2,181	24,045	280	13,297	1.518
1984	1,235	25,280	370	13,754	1.570
1985	1,557	26,837	430	14,423	1.646
1986	1,362	28,199	430	15,009	1.713
1987	1,593	29,792	430	15,694	1.792
1988	1,205	30,997	430	14,994	1.712
1989	1,550	32,547	430	12,284	1.402
1990	1,177	33,724	430	9,499	1.084
1991	1,004	34,728	430	7,291	0.832
1992	510	35,238	430	5,350	0.611
1993	0	35,238	430	4,739	0.541
1994	0	35,238	430	4,282	0.489
1995	0	35,238	430	3,612	0.412
1996	0	35,238	430	3,027	0.346
1997	0	35,238	430	2,342	0.267
1998	0	35,238	430	1,824	0.208
1999	0	35,238	430	1,157	0.132
2000	0	35,238	430	651	0.074
2001	0	35,238	430	219	0.025
2002-2004	0	35,238	430	0	0.000
Electricity Savings Since Start of Program:				180,357	MWh

Program Expenditures

The total program expenditures from 1978 through 1992 were \$4,233,874. This program cost estimate is only approximate, however, due to the difficulty of separating labor hours for home energy audits only from those audits leading to participation in the Home Energy Loan Program (*HELP*) or the Low-Income Electric Program (*LIEP*). The relatively high 1992 expenditures reflect special program closeout activities.

HOME ENERGY CHECK PROGRAM

PROGRAM EXPENDITURES FOR THE HOME ENERGY CHECK PROGRAM (4)

Year	Expenditures
1978	\$305,595
1979	563,447
1980	670,641
1981	712,948
1982	691,533
1983	730,276
1984	85,971
1985	34,433
1986	36,107
1987	35,214
1988	42,210
1989	55,217
1990	37,541
1991	70,724
1992	162,017
1993-2004	0
Total	\$4,233,874

Notes

- Participant figures include City Light audits for both electrically heated and nonelectrically heated buildings (excluding Department of Housing and Human Services [DHHS] audits). However, beginning in 1984, figures do not include customers who received Home Energy Check audits and subsequently participated in the Home Energy Loan Program (*HELP*) or the Low-Income Electric Program (*LIEP*).
- The energy savings are based on a weighted average of savings for electric heat and nonelectric heat customers. (See the *Evaluation of the Home Energy Check Program*, November 1981). For 1978-1980, the average savings were 690 kWh per year. Since 1981, a significant portion of the audited homes entered *HELP*; a lesser number entered *LIEP*. Only the average savings for those audited homes that did not enter *HELP* or *LIEP* were calculated, based on the weighted average of the savings from electrically and nonelectrically heated homes.
- Savings by year were reduced in 1988 through 1993 due to the deletion of savings by the 1978 through 1983 participants, for whom the lifetime of the measures installed by auditors and homeowners has been reached.

First year energy savings from new participants completing work in each year were: 1,218 MWh (1978); 3,377 MWh (1979); 3,291 MWh (1980); 2,640 MWh (1981); 2,161 MWh (1982); 611 MWh (1983); 457 MWh (1984); 670 MWh (1985); 586 MWh (1986); 685 MWh (1987); 518 MWh (1988); 667 MWh (1989); 506 MWh (1990); 432 MWh (1991); and 219 MWh (1992).

HOME ENERGY CHECK PROGRAM

4. Cost data for 1978-1980 are from the *Evaluation of the Home Energy Check Program* (November 1981). The 1981-1982 expenditures are from City Light MIS reports; however, \$223,669 of the 1981 expenditures are included under the Home Energy Loan Program. Expenditures for 1978-1982 also include the costs to operate the small Neighborhood Conservation Workshops Program. The 1983 data are from the Conservation Data Base, Energy Management Services Division (EMSD).

The 1984-1992 figures incorporate expenditures charged to the discontinued Blanket Seattle Program, which provided water heater insulation and thermostat setbacks from 1977-1983. Administrative cost data charged to Blanket Seattle in 1984 are from the Conservation Data Base, EMSD. Some 1984 measures cost data were inadvertently charged to the *HELP* and cannot be accurately recovered. The remaining 1984-1990 figures are from City Light MIS reports for Work Order Nos. 70585-01 and 70571-02. Closeout activities in 1992 included mailing compact fluorescent lamps to customers on still on waiting lists for service at the end of the program, along with self-audit informational materials.

Due to inaccurate use of work order numbers to differentiate the costs of audits in oil/gas heated homes from those in electrically heated homes, during the 1980s, the figures reported in this table do not accurately reflect the true labor costs of the audits for participants reported in the previous table. In 1990 through 1992 there were no expenses for water heater insulation materials and supplies (\$10,716 in 1989) due to the reduced activity level for this service and adequate inventory from the previous year. Cost data for 1991 and 1992 are from the Seattle Financial Management System, for Work Order Nos. 70585-01 and 70571-02.

HOME ENERGY LOAN PROGRAM

Description

The Home Energy Loan Program (*HELP*) replaced the Residential Insulation Program in 1981. It provided zero-interest loans to electrically heated households for weatherization. The program also worked with landlords to serve rental as well as owner-occupied homes. Caulking and weather-stripping, wall insulation, storm windows/insulated glass, thermal patio door glass, and automatic clock thermostats were the available optional measures. Private contractors, selected by the individual homeowners, installed the measures while Seattle City Light managed and paid the contractors. Since 1984, customers had the option to choose a 50% rebate if they elected to repay with cash in the first year instead of assuming a loan. In 1987 the terms of this offer were revised to require payment up front (rather than anytime during the first year) to qualify for the 50% rebate.

In late 1982 the Bonneville Power Administration (BPA) began offering its regional Energy Buy Back (EBB) program. This program provided payments through utilities to participating electric heat customers for the estimated value of energy saved by the measures installed. First in 1982-1983 and again in 1985-1986, Bonneville EBB funds were provided to City Light customers as a supplement to *HELP* benefits. In 1987, EBB funds for *HELP* were applied only to Low-Income Electric Program (*LIEP*) customers who went through *HELP* for windows. In late 1991, City Light began participation in the BPA's Weatherwise funding program. Funding provided by the BPA via the Third Party Financing Agreement began in June 1994.

1993 was the last full year of operation for the Home Energy Loan Program; a portion of jobs contracted in 1993 reached completion in 1994. This program was replaced in 1994 by the new Warm Home Program.

Eligible Population

This program served single-family and multiplex (2- to 4-unit) electrically heated buildings, with residents of moderate to high income. Some low-income customers also participated in *HELP* to receive financial assistance for insulated window glass.

HOME ENERGY LOAN PROGRAM

Lifetime of Conservation Measures Installed: 30 years

Electricity Savings

Re-entry refers to participants returning for service by the same or a different City Light weatherization program, seeking installation of measures not received during their prior participation; e.g. to finance windows separately from participation in *LIEP* or *HELP* for insulation services only. The average single-family building that received weatherization financing from *HELP* saves about 2,445 kilowatt-hours (kWh) per year, while single-family homes that re-entered the program to receive window measures save an additional 1,910 kWh per year. These savings represent 12% and 10%, respectively, of the typical electrically-heated single-family home's energy use (19,580 kWh in 1990).

Multiplex buildings weatherized by this program save 1,845 kWh per unit annually, while multiplexes that re-entered the program for window measures save an additional 1,270 kWh per unit annually. These savings represent 12% and 10%, respectively, of the typical electrically-heated multiplex's energy use (a weighted average across units of 12,493 kWh in 1990).

Since 1981, *HELP* has saved a total of 456,757 megawatt-hours (MWh). Energy savings in 2004 from cumulative (1981-1994) participants were 24,180 MWh. The load reduction in 2004 due to this program was 2.760 average megawatts (aMW).

HOME ENERGY LOAN PROGRAM

ELECTRICITY SAVINGS FOR THE HOME ENERGY LOAN PROGRAM

Year	Building Type (1)	Buildings by Year (2)	Units by Year (3)	kWh First Year Savings per Building (4)	MWh Savings in Year (5)	Avg. MW Load Reduction in Year
1981	Single Family	155	155	2,505	388	0.044
	Multiplex	12	23	2,507	30	0.003
	Annual Total	167	178	—	418	0.048
1982	Single Family	1,140	1,140	1,827	2,522	0.288
	Multiplex	118	131	1,452	201	0.023
	Annual Total	1,258	1,271	—	2,723	0.311
1983	Single Family	1,797	1,797	2,228	6,750	0.771
	SF Re-entry	387	387	1,300	503	0.057
	Multiplex	107	233	2,848	506	0.058
	MP Re-entry	15	27	1,080	16	0.002
	Annual Total	2,306	2,444	—	7,775	0.888
1984	Single Family	795	795	2,412	7,325	0.836
	SF Re-entry	372	372	1,300	987	0.113
	Multiplex	407	944	3,034	1,741	0.199
	MP Re-entry	10	28	1,680	33	0.004
	Annual Total	1,584	2,139	—	10,086	1.151
1985	Single Family	891	891	1,879	9,240	1.055
	SF Re-entry	291	291	1,300	1,365	0.156
	Multiplex	60	183	3,989	1,980	0.226
	MP Re-entry	10	28	1,680	50	0.006
	Annual Total	1,252	1,393	—	12,635	1.442
1986	Single Family	1,136	1,136	1,654	10,435	1.191
	SF Re-entry	209	209	1,300	1,637	0.187
	Multiplex	105	245	3,052	2,300	0.263
	MP Re-entry	6	14	1,715	60	0.007
	Annual Total	1,456	1,604	—	14,432	1.647
1987	Single Family	712	712	1,835	11,742	1.340
	SF Re-entry	88	88	1,300	1,751	0.200
	Multiplex	83	203	3,199	2,566	0.293
	MP Re-entry	8	20	1,838	75	0.009
	Annual Total	891	1,023	—	16,134	1.842
1988	Single Family	631	631	1,835	12,900	1.473
	SF Re-entry	59	59	1,300	1,828	0.209
	Multiplex	97	270	3,641	2,919	0.333
	MP Re-entry	4	12	2,205	84	0.010
	Annual Total	791	972	—	17,731	2.024
(Cont'd.)						

HOME ENERGY LOAN PROGRAM

ELECTRICITY SAVINGS FOR THE HOME ENERGY LOAN PROGRAM

(Continued)

Year	Building Type (1)	Buildings by Year (2)	Units by Year (3)	kWh First Year Savings per Building (4)	MWh Savings in Year (5)	Avg. MW Load Reduction in Year
1989	Single Family	479	479	1,835	13,779	1.573
	SF Re-entry	13	13	1,300	1,845	0.211
	Multiplex	90	251	3,648	3,248	0.371
	MP Re-entry	1	2	1,470	85	0.010
	Annual Total	583	745	—	18,957	2.164
1990	Single Family	502	502	2,110	14,838	1.694
	SF Re-entry	12	12	1,575	1,864	0.213
	Multiplex	94	259	4,271	3,649	0.417
	MP Re-entry	0	0	0	84	0.010
	Annual Total	608	773	—	20,435	2.333
1991	Single Family	500	500	2,365	16,020	1.829
	SF Re-entry	93	93	1,830	2,034	0.232
	Multiplex	84	232	4,806	4,053	0.463
	MP Re-entry	12	32	3,120	123	0.014
	Annual Total	689	857	—	22,230	2.538
1992	Single Family	255	255	2,445	16,644	1.900
	SF Re-entry	34	34	1,910	2,099	0.240
	Multiplex	55	163	5,468	4,354	0.497
	MP Re-entry	3	6	2,540	129	0.015
	Annual Total	347	458	—	23,226	2.651
1993	Single Family	229	229	2,445	17,204	1.964
	SF Re-entry	25	25	1,910	2,146	0.245
	Multiplex	30	80	4,920	4,501	0.514
	MP Re-entry	5	11	2,794	144	0.016
	Annual Total	289	345	—	23,995	2.739
1994	Single Family	52	52	2,445	17,331	1.978
	SF Re-entry	1	1	1,910	2,148	0.245
	Multiplex	12	30	4,613	4,557	0.520
	MP Re-entry	0	0	—	144	0.016
	Annual Total	65	83	—	24,180	2.760
(cont'd.)						

HOME ENERGY LOAN PROGRAM**ELECTRICITY SAVINGS FOR THE HOME ENERGY LOAN PROGRAM**

(Continued)

Year	Building Type (1)	Buildings by Year (2)	Units by Year (3)	kWh First Year Savings per Building (4)	MWh Savings in Year (5)	Avg. MW Load Reduction in Year
1995	Annual Total	0	0	—	24,180	2.760
1996	Annual Total	0	0	—	24,180	2.760
1997	Annual Total	0	0	—	24,180	2.760
1998	Annual Total	0	0	—	24,180	2.760
1999	Annual Total	0	0	—	24,180	2.760
2000	Annual Total	0	0	—	24,180	2.760
2001	Annual Total	0	0	—	24,180	2.760
2002	Annual Total	0	0	—	24,180	2.760
2003	Annual Total	0	0	—	24,180	2.760
2004	Annual Total	0	0	—	24,180	2.760
Program Totals 1981-2004:						
	Single Family	9,274	9,274	—	330,428	—
	SF Re-entry	1,584	1,584	—	41,687	—
	Multiplex	1,354	3,247	—	82,175	—
	MP Re-entry	74	180	—	2,467	—
	All Buildings	12,286	14,285	—	456,757	—
Electricity Savings Since Start of Program:					456,757	MWh

Program Expenditures

The program expenditures from 1981 through 1994 for administration and measure installation totaled \$36,848,717. Total expenditures in 1994 were \$168,249. This represents the cost to the utility, and not the total resource cost. The Bonneville Power Administration, over the life of the program, provided \$4,766,540 in funding.

HOME ENERGY LOAN PROGRAM**PROGRAM EXPENDITURES FOR THE HOME ENERGY LOAN PROGRAM**

Year	Administration (6)	Measure Installation (7)	Total Expenditures
1981	\$163,479	\$257,949	\$421,428
1982	390,572	2,485,304	2,875,876
1983	1,032,068	4,471,027	5,503,095
1984	1,164,754	2,540,742	3,705,496
1985	1,053,891	2,697,823	3,751,714
1986	1,079,046	3,576,107	4,655,153
1987	869,505	1,986,676	2,856,181
1988	835,568	1,767,098	2,602,666
1989	831,011	1,372,816	2,203,827
1990	768,511	2,238,235	3,006,746
1991	693,163	1,603,785	2,296,948
1992	556,308	892,407	1,448,715
1993	763,069	589,008	1,352,077
1994	155,752	12,560	168,312
1995-2004	0	0	0
Total	\$10,356,697	\$26,491,537	\$36,848,234

FINANCIAL EFFICIENCY MEASURES FOR THE HOME ENERGY LOAN PROGRAM
 — Per Completed Unit —

Year	Average Administration	Average Installation	Average Total Expenditure	Administration as a % of Total Expenditures
1981	\$918	\$1,449	\$2,368	38.8%
1982	307	1,955	2,263	13.6
1983	422	1,829	2,252	18.8
1984	545	1,188	1,732	31.4
1985	757	1,937	2,693	28.1
1986	673	2,229	2,902	23.2
1987	850	1,942	2,792	30.4
1988	860	1,818	2,678	32.1
1989	1,115	1,843	2,958	37.7
1990	994	2,896	3,890	25.6
1991	809	1,871	2,680	30.2
1992	1,215	1,948	3,163	38.4
1993	2,212	1,707	3,919	56.4
1994	1,877	151	2,028	92.5
1995-2004	0	0	0	0.0
Average 1981-1994	\$725	\$1,855	\$2,580	28.1%

HOME ENERGY LOAN PROGRAM

BPA FUNDING FOR THE HOME ENERGY LOAN PROGRAM (8)

Year	Administration (9)	Weatherization	Total Funding
1981	\$0	\$0	\$0
1982	142,720	604,217	746,937
1983	247,520	1,275,462	1,522,982
1984	0	0	0
1985	38,775	79,655	118,430
1986	259,205	1,110,278	1,369,483
1987	9,370	30,702	40,072
1988	27,578	1,510	29,088
1989	49,215	0	49,215
1990	13,612	0	13,612
1991	58,836	0	58,836
1992	37,796	201,495	239,291
1993	56,530	326,592	383,122
1994	337	195,135	195,472
1995-2004	0	0	0
Total	\$941,494	\$3,825,046	\$4,766,540

Notes

1. Building and unit figures include the numbers of homes where weatherization work was completed and contractors were paid. The source was *HELP* records maintained by the EMSD Community Conservation (Residential) Section.

The participant buildings have been further broken out by single family versus multiplex and original entry versus re-entry to the program (typically *LIEP* re-entries into *HELP* for window measures). This disaggregation was accomplished for 1981-1987 using figures compiled by Residential Conservation Section for weatherization work contracted (or authorized, rather than completed) for each year.

The total numbers of units per year represent an accurate count of weatherizations completed, while the breakdowns of buildings (i.e., single family versus multiplexes and the re-entries) were derived using program year percentages obtained from counts of contracted work per year. For 1988 the single family and multiplex counts are actual and the re-entries are estimated based on counts of contracted work. In 1989 through 1993, re-entry counts are actual, as well.

The breakdown of buildings and units with work contracted during each program year is provided below. Unit-level counts for multiplex buildings are not available for 1981-1983. These contracted participation figures are frequently quoted in budget tracking.

HOME ENERGY LOAN PROGRAM

<u>Year</u>	<u>Contracted Buildings</u>	<u>Contracted Units</u>
1981	899	970
1982	1401	1560
1983	1895	2035
1984	1470	2038
1985	1354	1480
1986	1229	1383
1987	884	1049
1988	777	964
1989	611	771
1990	608	773
1991	551	695
1992	305	398
1993	206	245

2. The numbers of buildings are disaggregated as described in Note 1 above. The percentages of buildings estimated to be multiplexes, by year, were: 7.3% (1981), 9.4% (1982), 5.3% (1983), 26.3% (1984), 5.6% (1985), 7.6% (1986), and 10.2% (1987). In 1988 through 1994 the actual percentages of multiplexes were 12.8%, 15.6%, 15.5%, 14.6%, 16.7%, 12.1%, and 23.1%, respectively. In 1984, 748 units in 334 buildings were completed for the Seattle Housing Authority, hence the high percentage of multiplexes in that year.

Re-entries into *HELP* (from *HELP* or *LIEP*) began in 1983. The percentages of buildings estimated to be re-entries (1983-1988) and actual re-entries (1989-1994), by year and type, were:

<u>Year</u>	<u>Single-family</u>	<u>Multiplex</u>
1983	17.7%	12.1%
1984	31.9	2.5
1985	24.6	14.9
1986	5.5	5.7
1987	11.0	8.3
1988	8.6	4.0
1989	2.6	1.1
1990	2.3	0.0
1991	15.7	12.5
1992	11.8	5.2
1993	9.8%	14.3%

3. The counts of units in multiplex buildings are derived from Community Conservation (Residential) Section staff records of contracted weatherizations per year. From 1981 to 1987, the numbers of multiplex buildings are estimated; starting in 1988, both unit and building figures represent actual counts.
4. Measured energy savings figures are drawn from three evaluations of the *HELP* Program: the *Longitudinal Evaluation of Energy Savings from the Home Energy Loan Program* (August 1988), *Energy Savings for Multiplex Buildings in the Home Energy Loan Program* (September 1988), and *Energy Savings for Windows Only Participants in the Home Energy Loan Program* (March 1990). Single-family building net savings were estimated by a time-series cross-sectional regression model applied to weather-normalized annual consumption. Multiplex building net savings were estimated by analysis of covariance (ANCOVA). Re-entry building net savings were estimated by a regression model incorporating weather and price effects.

From 1981 to 1986, single-family savings are represented in this table by a figure that describes the estimated first-year savings for buildings weatherized during the current program year only. Beginning in 1987, first year and subsequent year savings are fixed at a level that represents the weighted mean of 1987 savings from the 1981 through 1986 participants combined. See Note 5 below for the actual year-by-year estimates of net savings for each group of participants.

HOME ENERGY LOAN PROGRAM

Multiplex building savings were found to be on average about 1,308 annual kilowatt-hours per unit (based on a sample with an average unit-per-building ratio of 2.4). This figure was applied to all multiplex program participants at the unit level per year, and then divided by the number of buildings for the year to estimate savings per building. This adjusts for the varying unit-per- building ratios over the program years.

Buildings weatherized by *HELP* typically have saved less energy than those weatherized by *LIEP*, due to fewer measures being required by *HELP* buildings in the early years of the program, and even fewer being found necessary over time in more recent applicant buildings. *HELP* re-entrants were predominantly comprised of former *LIEP* participants receiving new windows via *HELP*. Regression estimates of savings for “window only” single-family buildings were found to be approximately 1300 annual kilowatt-hours.

Beginning in 1990, savings for *HELP* participants have been adjusted to account for the increased efficiency of window technology during 1990-1992. (Average heat-loss coefficients have shifted from $U=0.72$ in 1986 through 1989, to $U=0.58$ in 1990, to $U=0.46$ in 1991, and to $U=0.40$ in 1992.) This shift in efficiency is estimated to result in additional savings for single-family buildings of 275 kWh in 1990, 255 in 1991, and 80 in 1992. The incremental savings for multiplex participants are estimated to be 242 kWh per unit in 1990, 190 kWh in 1991, and 105 in 1992. These estimates incorporate an adjustment for changes in the average square footage of windows retrofitted in each year. No change in window technology is projected for 1993.

5. The savings by year (MWh) totals reflect savings for the current year participants plus savings accrued by prior participants within each category of building type. Single-family building savings were found to vary from year to year for prior participants, as may be seen from these kilowatt-hour per building estimates (note that for years 1986 through 1989, the estimates are carried through at the level of the last post-weatherization year evaluated):

Participation Year	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Sixth and Later Years
1981	2505	2836	2650	2302	2261	2145
1982	1827	2049	1713	2109	2437	2437
1983	2228	1724	1837	1540	1540	1540
1984	2412	1900	1095	1095	1095	1095
1985	1879	2029	2029	2029	2029	2029
1986	1654	1654	1654	1654	1654	1654
1987-1989	1835	1835	1835	1835	1835	1835

Additional documentation may be found in the *Longitudinal Evaluation of Energy Savings from the Home Energy Loan Program* (August 1988).

First year energy savings from new participants completing work in each year were: 418 MWh (1981); 2,254 MWh (1982); 4,828 MWh (1983); 3,653 MWh (1984); 2,309 MWh (1985); 2,481 MWh (1986); 1,701 MWh (1987); 1,597 MWh (1988); 1,226 MWh (1989); 1,480 MWh (1990); 1,794 MWh (1991); 997 MWh (1992); 769 MWh (1993); and 184 MWh (1994).

6. Program expenditures for City Light EMSD administration include the following for Work Order No. 70576 (-03, -04, -05, -10): salaries, wages, labor-related costs; materials, supplies, printing; paid media space; data processing costs; travel phones, postage, rental equipment, and other.

HOME ENERGY LOAN PROGRAM

Labor costs also include expenses for Home Energy Check (*HEC*) audits of electrically-heated homes. The source for these data from 1981 through 1990 is City Light MIS reports for Work Order No. 70576-03. Cost data for 1991 through 1994 are from the Seattle Financial Management System for this same Work Order No. as well as 70585-01 and 70571-02. Administrative costs attributable to *HEC* audits were \$253,036 in 1988; \$236,684 in 1989; \$205,192 in 1990; \$207,225 in 1991; \$136,533 in 1992; and \$66,574 in 1993. These figures do not reflect BPA funding.

Administrative costs for 1993-1994 include a new A&G overhead charge (begun in April 1993) for utility administrative and general expenses. This charge distributes departmental administrative and general expenses, including nonprogrammatic labor and expenses, to individual conservation programs in proportion to programmatic labor hours. In 1993 the A&G overhead charge for the *HELP* was \$230,589, or 30% of total programmatic administrative expenditures; in 1994 it was \$26,325 (17%).

7. Program weatherization costs were compiled from year-end Cost Ledger Reports from the City Light Finance Division for Work Order No. 70576-09, from 1981 through 1990. In 1991 through 1994, cost data are from year-end SFMS reports for this Work Order No. The cost of most 1993 measures was accrued at the closing of 1993 ledgers. These figures reflect the total cost of measure installation (including costs incurred by the customer in excess of program allowances). Since the customer pays these monies to the utility, which then pays all contractor invoices in full, actual customer loans are often lower for this reason. Presented below are the annual excess payments in nominal dollars made by customers from 1988 through 1994, as reported by the Community Conservation/Contracts Unit (these data are estimated for 1981-1987).

<u>Year</u>	<u>Excess Pmts</u>	<u>Cumulative</u>
1981	\$68,900	\$68,900
1982	663,400	732,300
1983	1,118,035	1,850,335
1984	678,200	2,528,535
1985	720,200	3,248,735
1986	954,600	4,203,335
1987	530,300	4,733,635
1988	213,574	4,947,209
1989	363,176	5,310,385
1990	452,368	5,762,753
1991	618,012	6,380,765
1992	308,396	6,689,161
1993	\$219,213	\$6,908,374

8. These data are based on City Light invoices submitted to and paid by BPA. City Light did not participate in the regional Energy Buy Back Program in 1984. City Light began to participate in the BPA Weatherwise program in October 1991.
9. The BPA administration reimbursement also includes costs to BPA for radon monitoring, training, and water heater tank wraps: \$7,050 in 1985; \$10,355 in 1986; \$5,095 in 1987; none in 1988 through 1991; \$320 in 1992; and none in 1993-1994.

HOME WATER SAVERS PROGRAM

Description

Begun in 1992, this program embraces activities in two residential sector existing building stocks: single-family and multiplex buildings (having two to four units), and multifamily buildings (having five or more units). It was operated from 1992 to 1995 in conjunction with the Bonneville Power Administration (BPA) through the Residential Conservation Agreement. Funding provided by the BPA via the Third Party Financing Agreement began in June 1994.

During the summer of 1992, Seattle City Light conducted the Home Water Savers Program (*HWSP*) Kit distribution, in cooperation with Puget Sound Power and Light Company and the Seattle Water Department. Supporting partners included the BPA, the Municipality of Metropolitan Seattle–Metro (waste water), and the Washington Natural Gas Company. This regional program distributed water and energy efficiency products to all single-family residences and multiplex buildings. Within Seattle City Light's service area, Home Water Savers Kits were distributed door-to-door, free of charge, to approximately 147,000 residences with electric water heat. An additional 46,000 residences with gas or other fuel water heat received Kits funded by the Seattle Water Department. All customers, both gas and electric, received in their Kits toilet water-saving products provided by the Water Department. Distribution was performed by the Seattle Conservation Corps, a section of the Department of Housing and Human Services (DHHS).

Each Home Water Savers Kit contained an efficient-flow showerhead rated at 2.5 gallons per minute, a 1.5 gpm bathroom faucet aerator, a toilet flow device, and toilet tank leak detection tablets, along with informational materials. Additional products and adapters were provided to customers upon request, to assist in their self-installation of the products. Direct installation was provided for elderly and disabled customers requesting assistance.

The program also provided direct installation of showerheads and faucet aerators (bathroom and kitchen) in multifamily buildings containing five units or more and having electric water heat, beginning in November 1992 and extending through 1994. The goal was to directly install the efficient-flow products in 45,000 multifamily units during that period. Direct installation services were provided by the Seattle Conservation Corps, the Seattle Water Department, the Seattle Housing Authority, and individual building owners. During the 1995 *HWSP* completion year, products were self-installed by building operators.

HOME WATER SAVERS PROGRAM

Eligible Population

This program served the 301,679 customers residing in single-family homes, multiplexes, mobile homes, condominiums, and multifamily apartment buildings within the Seattle City Light service area. A total population of 690,000 lives in Seattle City Light's 131 square mile service area.

Lifetime of Conservation Measures Installed: 15 years

Electricity Savings

The average single-family residence that participated in *HWSP* saves about 300 kilowatt-hours (kWh) per year from each showerhead installed and 15 kWh from the bathroom faucet aerator. This represents three percent (3%) of the average electric water heat home's energy use (14,159 kWh in 1990).

The average multiplex (two to four unit) residence that participated in *HWSP* saves about 200 kilowatt-hours (kWh) per year from each showerhead installed and 80 kWh from the bathroom faucet aerator. This represents two percent (2%) of the average electric water heat unit's energy use (11,354 kWh in 1990).

The average multifamily (five or more unit) residence that participated in *HWSP* saves about 200 kilowatt-hours (kWh) per year from each showerhead installed, and 170 kWh from the bathroom and kitchen faucet aerators. This represents five percent (5%) of the typical electric water heat unit's energy use (7,977 kWh in 1990).

Since 1992, *HWSP* has saved a total of 546,555 megawatt-hours (MWh). Energy savings in 2004 from cumulative (1992-1995) participants were 43,659 MWh. The load reduction in 2004 due to this program was 4.984 average megawatts (aMW).

HOME WATER SAVERS PROGRAM**ELECTRICITY SAVINGS FOR THE HOME WATER SAVERS PROGRAM**

Year	Building Type	Buildings by Year (1)	Units by Year (1)	kWh Savings per Participant (2)	MWh Savings in Year (2)	Avg. MW Load Reduction in Year
1992	Single-family	76,577	76,577	317	24,250	2.768
	Multiplex	4,147	10,666	258	2,747	0.314
	Multifamily	216	3,984	370	1,474	0.168
	Annual Total	80,940	91,227	—	28,471	3.250
1993	Single-family	968	968	365	24,604	2.809
	Multiplex	0	0	—	2,747	0.314
	Multifamily	1,278	24,846	370	10,667	1.218
	Annual Total	2,246	25,814	—	38,018	4.340
1994	Single-family	593	593	365	24,820	2.833
	Multiplex	0	0	—	2,747	0.314
	Multifamily	728	14,456	363	15,908	1.816
	Annual Total	1,321	15,049	—	43,476	4.963
1995	Single-family	0	0	348	24,820	2.833
	Multiplex	0	0	—	2,747	0.314
	Multifamily	28	562	326	16,092	1.837
	Annual Total	28	562	—	43,659	4.984
1996	Annual Total	0	0	—	43,659	4.984
1997	Annual Total	0	0	—	43,659	4.984
1998	Annual Total	0	0	—	43,659	4.984
1999	Annual Total	0	0	—	43,659	4.984
2000	Annual Total	0	0	—	43,659	4.984
2001	Annual Total	0	0	—	43,659	4.984
2002	Annual Total	0	0	—	43,659	4.984
2003	Annual Total	0	0	—	43,659	4.984
2004	Annual Total	0	0	—	43,659	4.984
Program Totals 1992-2004:						
	Single-family	78,138	78,138	—	321,874	—
	Multiplex	4,147	10,666	—	35,711	—
	Multifamily	2,250	43,848	—	188,970	—
	Annual Total	84,535	132,652	—	546,555	—
Electricity Savings Since Start of Program:					546,555	MWh

HOME WATER SAVERS PROGRAM

Program Expenditures

City Light's total program expenditures in 1995 were \$35,129. In 1992 the Bonneville Power Administration funded 75% of expenditures for products and promotion, under a cost-sharing agreement, while Seattle City Light paid 25% of these costs. The BPA also funded 75% of an allowance for distribution and installation of showerheads, adapters, and faucet aerators. Seattle City Light administered the program and distribution contractors. In 1993 and 1994 the BPA funded 100% of allowed promotion and advertising expenses, as well as 100% of an allowance for the installation of efficient showerheads which extended into 1995. The costs reported here do not reflect the total resource cost of this program.

The flow of monies for this program may be confusing. However, from the standpoint of an electricity savings program, the regional cost would include the following components: Seattle City Light administration, BPA administration, fixture purchases, and delivery or installation. The BPA's administration costs were not known for this report. The remaining costs for 1992-1995 total \$2,673,669, comprised of \$369,312 for administration and \$2,304,357 for measures. Seattle City Light administration expenditures were 14% of this aggregate program cost.

SEATTLE CITY LIGHT EXPENDITURES FOR THE HOME WATER SAVERS PROGRAM

Year	Administration (3)	Measures (4)	Total Expenditures
1991	\$14,950	\$0	\$14,950
1992	215,486	680,358	895,844
1993	60,723	169,023	229,746
1994	57,974	133,386	191,360
1995	35,129	0	35,129
1996-2004	0	0	0
Total	\$384,262	\$982,767	\$1,367,029

BPA FUNDING / REIMBURSEMENT TO SEATTLE CITY LIGHT FOR THE HOME WATER SAVERS PROGRAM

Year	Administration (5)	Measures (6)	Total Funding
1992	\$161,615	\$942,060	\$1,103,675
1993	2,280	426,495	428,775
1994	2,792	190,495	193,287
1995	0	5,180	5,180
1996-2004	0	0	0
Total	\$166,687	\$1,564,530	\$1,731,217

HOME WATER SAVERS PROGRAM

BPA DIRECT PAYMENTS TO PURCHASE FIXTURES FOR THE HOME WATER SAVERS PROGRAM

Year	Expenditures (7)
1992	\$1,226,590
1993	95,000
1994-2004	0
Total	\$1,321,590

Notes

1. The eligible population figure is from the *Seattle City Light Customer Guide* (1994).

The numbers of Seattle City Light households by building type are based upon Seattle City Light and Seattle Water Department customer records, and on the 1990 Federal Census. The percentages of residences having electric water heat are taken from the July 1992 Seattle City Light Load Forecast. Installation and persistence rates for single-family and multiplex residents are estimated from evaluation survey research, documented in *Survey Research for the Home Water Savers Program, Phase I Report* (April 1993) and *Phase II Report* (March 1994).

According to the first survey, within the first five months after kit distribution 43% of residents had installed the showerhead (net of 9% free ridership), and 29% had installed the bathroom faucet aerator. Another 11% of residents felt they already had efficient flow showerheads in place.

HOME WATER SAVERS PROGRAM**PROGRAM INSTALLATIONS**

	Kits Delivered		Showerheads Installed		Aerators Installed	
	Buildings	Units	Buildings	Units	Buildings	Units
1992 Self-Installation						
Single family	121,712	121,712	68,159	68,159	48,685	48,685
Duplex	4,294	8,588	2,405	4,810	1,718	3,435
Triplex	1,653	4,959	926	2,777	661	1,984
Fourplex	1,281	5,124	717	2,868	512	2,050
<i>Subtotal</i>	<i>128,940</i>	<i>140,383</i>	<i>72,207</i>	<i>78,614</i>	<i>51,576</i>	<i>56,154</i>
1992 Direct/Verified Installation						
Single family			8,418	8,418	8,418	8,418
Duplex-Fourplex			99	210	99	210
<i>Subtotal</i>			<i>8,517</i>	<i>8,628</i>	<i>8,517</i>	<i>8,628</i>
Shower-rooms			—	38	—	0
Multifamily WZ Pgm*			42	829	42	829
By SCC (DHHS)			64	1,281	64	1,281
By SHA			30	601	30	601
By owner, SCL verified			74	1,484	74	1,484
<i>Subtotal</i>			<i>210</i>	<i>4,233</i>	<i>210</i>	<i>4,195</i>
1992 Multifamily Consumer Demand			<i>24</i>	<i>486</i>	<i>0</i>	<i>0</i>
1992 TOTAL INSTALLATIONS			80,958	91,961	60,303	68,977
1993 Direct/Verified Installation						
<i>Single family</i>			<i>968</i>	<i>968</i>	<i>968</i>	<i>968</i>
Shower-rooms / Skagit			—	10	—	4
Multifamily WZ Pgm*			9	170	9	170
By SCC (DHHS)			716	14,326	716	14,326
By SHA			272	5,436	272	5,436
By SWD			104	1,359	104	1,359
By New Construction			31	619	31	619
By owner, SCL verified			24	482	24	482
<i>Subtotal</i>			<i>1,156</i>	<i>22,398</i>	<i>1,156</i>	<i>22,392</i>
1993 Multifamily Consumer Demand			<i>131</i>	<i>2,614</i>	<i>131</i>	<i>2,614</i>
1993 TOTAL INSTALLATIONS			2,255	25,984	2,255	25,978
1994 Direct/Verified Installation						
<i>Single family</i>			<i>593</i>	<i>593</i>	<i>593</i>	<i>593</i>
Shower Rooms			—	9	—	0
Multifamily WZ Pgm*			5	91	5	91
By SCC (DHHS)			675	13,495	675	13,495
By SWD			31	622	0	0
<i>Subtotal</i>			<i>711</i>	<i>14,217</i>	<i>680</i>	<i>13,586</i>
1994 Multifamily Consumer Demand			<i>17</i>	<i>330</i>	<i>17</i>	<i>330</i>
1994 TOTAL INSTALLATIONS			1,321	15,140	1,290	14,509
1995 Multifamily Consumer Demand			<i>28</i>	<i>562</i>	<i>28</i>	<i>562</i>
1995 TOTAL INSTALLATIONS			28	562	28	562

The second survey, one year after distribution, assessed longer-term installation and persistence rates. It was found that 65% of residents who received a Kit did install the showerheads and still had the measure installed in fall of 1993. This means that 56% of single-family residents (net of 9% free ridership) had installed the showerhead as a result of the program alone, and 40% had installed the

HOME WATER SAVERS PROGRAM

bathroom faucet aerator. An important finding from this evaluation was the lengthy delay between program distribution and self-installation of showerheads by many residents. A variety of barriers were responsible for non-installations.

In 1992, showerheads and both types of aerators were installed in privately-owned multifamily buildings either by the building owner (with inspection by Seattle City Light), or by the Seattle Conservation Corps. This continued in 1993-1994, along with direct installations made by the Seattle Housing Authority in low-income public multifamily buildings, and installation by the Seattle Water Department in multifamily buildings with high water consumption. The Water Department also performed toilet leak repairs. A small number of direct installations were made in Seattle City Light buildings (single- and multifamily) at the Skagit generation project; and by City Light Appliance Repair staff as they made service calls for other reasons in private Seattle homes. The Multifamily Conservation Programs install showerheads where needed; these are shown below but are excluded from the energy savings for *HWSP*.*

2. The energy savings are based on two in-home, pre/post metering studies conducted by Seattle City Light (multifamily buildings) and the Puget Sound Power and Light Company (single-family buildings), in cooperation with the BPA. The savings per participant reported here represent average kilowatt-hours from the metering studies, weighted by the proportions of residential units installing a showerhead and one or two aerators, as described in Note 1.

First year energy savings from new participants completing work in each year were: 28,472 MWh (1992); 9,546 MWh (1993); 5,458 MWh (1994); and 183 MWh (1995).

3. The administrative costs in 1991 include expenditures for customer preference testing. These costs exclude \$28,207 of expenditures in 1992, \$16,713 in 1993, and \$6,100 in 1994 for evaluation survey research. Included in 1992 are \$125,000 in advertising costs (75% funded by the BPA in a costs-sharing agreement) and \$90,486 in other administrative costs, including advertising costs.

Administrative costs for 1993-1995 include a new A&G overhead charge (begun in April 1993) for utility administrative and general expenses. This charge distributes departmental administrative and general expenses, including nonprogrammatic labor and expenses, to individual conservation programs in proportion to programmatic labor hours. In 1993 the A&G overhead charge for the *HWSP* was \$17,515, or 29% of total programmatic administrative expenditures; in 1994 it was \$15,847 (27%); in 1995 it was \$11,002 (31%).

4. These cost data for 1992 incorporate \$611,169 in expenditures for product packaging costs and the distribution contractor's labor and materials (provided the Department of Housing and Human Services' Seattle Conservation Corps, and by the Seattle Housing Authority). In 1993 these costs include \$144,537 for installations by the Conservation Corps and the Housing Authority. This amount was paid for program distribution to the 77% of customers with electric water heat. The source of these cost data for 1991-1995 is the Seattle Financial Management System for Work Order Nos. 70543 (-01, -04, -85, -87) and 70558 (-01, -85, -87).

The majority of the showerhead, adaptor, and aerator products were purchased by the BPA; however, one-fifth of the aerators were acquired in 1992 through City Purchasing (75% of this cost was reimbursed by the BPA through a cost-sharing arrangement). Included here under measure costs is Seattle City Light's direct purchase of fixtures and other operating supplies: \$3,702 in 1993; \$5,592 in 1994; and none in 1995.

HOME WATER SAVERS PROGRAM

An additional expense of \$180,522 was charged to the program work order number but is not included here. These monies, paid to the Seattle Conservation Corps for distribution to gas and oil water heat customers (23% of all City Light Customers), were reimbursed to City Light by the Seattle Water Department in 1992.

5. These data on administrative funding are based on City Light invoices submitted to the BPA for the calendar year under the Residential Conservation Agreement (RCA) contract, covering program promotion, advertising, and general administration. This amount excludes any other administrative costs incurred by the BPA for the regional program. The BPA paid 100% of allowable promotional and advertising expenses, in the amount of \$2,280 in 1993 and \$2,792 in 1994.

6. The source is EMSD Community Conservation (Residential) Section records on RCA billings to the BPA by calendar year. The BPA's 1992 funding schedule for showerheads was as follows: \$37 per direct installation in a single-family home or nonresidential building shower room; \$18 per direct installation in a multifamily unit; \$10.50 for delivery of a showerhead in response to consumer demand, with follow-up visit to pick up the old showerhead; and \$8.50 for each home to which a showerhead was delivered by door-to-door canvassing. No funding was provided based on the distribution of bathroom or kitchen faucet aerators.

In 1992 the BPA funded 75% of the total cost allowances for this program (\$1,595,755), amounting to \$1,196,816. Added to this amount is the BPA cost-share, \$51,892, for fixtures purchased by Seattle City Light (75% of 69,189). This subtotal has been reduced by the Seattle City Light cost share for fixtures purchased by the BPA (25% of 1,226,590), amounting to \$306,638.

In the fourth quarter of 1993 the BPA's funding schedule was amended as follows: \$25 per direct installation in a single-family home or nonresidential building shower room; \$13 per direct installation in a multifamily unit; and \$10 for delivery for a showerhead in response to consumer demand, provided that old showerheads were picked up in a follow-up visit. In 1993-1995 the BPA funded 100% of the total cost allowances for this program: \$428,775 in 1993; \$193,287 in 1994; and \$5,180 in 1995. The 1995 allowance includes 418 showerheads plus 400 kitchen aerators (motel installations were not invoiced to the BPA).

7. The BPA directly purchased—and provided to Seattle City Light—over \$1.2 million worth of showerheads, adapters, and aerators in 1992. The BPA 75% cost share for this amount was \$919,943. The Seattle City Light 25% cost share for these fixtures has been subtracted from the BPA's reimbursement amount. In 1993 the BPA directly provided another \$80,000 worth of kitchen faucet aerators, plus \$15,000 worth of new model efficient-flow showerheads.

In 1993-1995, Seattle City Light continued to transfer surplus stocks of showerheads (from the 1992 bulk purchase) to other utilities at the BPA's authorization.

NEIGHBORHOOD CONSERVATION WORKSHOPS

Description

From 1978-1982, the Neighborhood Conservation Workshops program presented home conservation information to groups of residential customers. Included were:

- Neighborhood block meetings;
- Two hands-on storm window workshops;
- Workshops on caulking, weather-stripping, making storm windows, and insulating attics; and
- Visits to individual participants' homes to assist them in conservation activities.

The average participant took hot water conservation actions, and some were less likely to install supplementary space heat after attending the workshop.

Eligible Population

This program served the Admiral neighborhood of West Seattle—approximately 7,000 electric and nonelectric space heat customers.

Lifetime of Conservation Measures Installed: 10 years

Electricity Savings

The average home that participated in the Neighborhood Conservation Workshops saved about 490 kilowatt-hours (kWh) per year. These savings represent four percent (4%) of the typical single-family home's electricity use (12,914 kWh in 1988).

Between 1978 and 1991, the Neighborhood Conservation Workshops Program saved 11,532 megawatt-hours (MWh). However, since the lifetime of these measures has expired, this program did not deliver any savings in 2004.

NEIGHBORHOOD CONSERVATION WORKSHOPS

Program Expenditures

There are no expenditure figures for this program because all expenses are included in the Home Energy Check Program.

ELECTRICITY SAVINGS FOR THE NEIGHBORHOOD CONSERVATION WORKSHOPS PROGRAM

Year	Participants by Year	Cumulative Participants	kWh Savings per Participant (1)	MWh Savings in Year (2)	Avg. MW Load Reduction in Year
1978	744	744	490	365	0.042
1979	342	1,086	490	532	0.061
1980	927	2,013	490	986	0.113
1981	256	2,269	490	1,112	0.127
1982	85	2,354	490	1,153	0.132
1983	0	2,354	490	1,153	0.132
1984	0	2,354	490	1,153	0.132
1985	0	2,354	490	1,153	0.132
1986	0	2,354	490	1,153	0.132
1987	0	2,354	490	1,153	0.132
1988	0	2,354	490	789	0.090
1989	0	2,354	490	621	0.071
1990	0	2,354	490	167	0.019
1991	0	2,354	490	42	0.005
1992-2004	0	2,354	490	0	0.000
Electricity Savings Since Start of Program:				11,532	MWh

Notes

1. Energy savings calculations are found in the *Evaluation of Seattle City Light's Neighborhood Workshop Program* (September 1981).
2. After 1982 the program was discontinued, so the later savings shown represent continuing savings from earlier program participants only. The savings by year were reduced beginning in 1988 due to the lifetime of the measures installed ten years previously having been reached. Savings are calculated for 1,610 customers in 1988, 1,268 customers in 1989, 341 customers in 1990, 85 customers in 1991, and 0 customers in 1992.

First year energy savings from new participants completing work in each year were: 365 MWh (1978); 168 MWh (1979); 454 MWh (1980); 125 MWh (1981); and 42 MWh (1982).

RESIDENTIAL EFFICIENCY STANDARDS

Description

From 1977 through 1980, City Light limited residential building heat-loss to 10 watts per square foot of total floor area, in single-family through triplex structures needing new or rewired conversion to electric space heat. This service connection requirement preceded enactment of the King County and City of Seattle Energy Codes, and ended an era of uncontrolled electric heat additions in the residential sector.

Since January 1981, a more stringent standard required that all residential customers requesting new or enlarged service for electric space heat had to install ceiling, floor, wall or window, heating duct, and water-heater insulation. These standards for electric service connection were superseded by requirements of the Seattle Energy Code in cases of total remodeling of residential units.

In August 1988 the residential efficiency standards were revised in Section 5.1 of the Requirements for Electric Service Connection to require that only the portion of the unit being converted to full or partial electric heat need be insulated; formerly the entire building was affected, even if the home was heated by gas or oil. An exemption agreement is required if a new or enlarged electric service is required for uses other than space heat. Since 1988 historical landmarks are partially exempted from the standards. The number of buildings needing new or enlarged service for electric space heat has declined markedly since 1982 due to changes over time in the relative prices of electricity and gas, so demand for this program is extremely low in recent years.

Eligible Population

The Residential Efficiency Standards adopted in 1981 apply to residential buildings for which a new or enlarged electric service is requested for the purpose of installing full or partial electric heat.

Lifetime of Conservation Measures Installed: 30 years

RESIDENTIAL EFFICIENCY STANDARDS

Electricity Savings

From 1981 through 1988, the average building installing conservation measures under the Residential Efficiency Standards 5.1 saved about 2,100 kilowatt-hours (kWh) per year. These savings represent 16% of the typical single-family home's electricity use (13,078 kWh in 1990).

Since 1981, the Residential Efficiency Standards have saved a total of 59,634 megawatt-hours (MWh). Energy savings in 2004 from cumulative (1981-1995) participants were 2,814 megawatt-hours (MWh). The load reduction in 2004 due to this program was 0.321 average megawatts (aMW).

ELECTRICITY SAVINGS FOR SINGLE-FAMILY HOMES UNDER THE RESIDENTIAL EFFICIENCY STANDARDS

Year	Single-Family Buildings by Year (1)	Cumulative Buildings	kWh Savings per Building (2)	MWh Savings in Year	Avg. MW Load Reduction in Year
1981	235	235	2,100	494	0.056
1982	362	597	2,100	1,254	0.143
1983	164	761	2,100	1,598	0.182
1984	152	913	2,100	1,917	0.219
1985	115	1,028	2,100	2,159	0.246
1986	80	1,108	2,100	2,327	0.266
1987	87	1,195	2,100	2,510	0.286
1988	66	1,261	2,100	2,648	0.302
1989	30	1,291	2,100	2,711	0.309
1990	14	1,305	2,100	2,741	0.313
1991	11	1,316	2,100	2,764	0.315
1992	5	1,321	2,100	2,774	0.317
1993	7	1,328	2,100	2,789	0.318
1994	9	1,337	2,100	2,808	0.321
1995	3	1,340	2,100	2,814	0.321
1996	0	1,340	2,100	2,814	0.321
1997	0	1,340	2,100	2,814	0.321
1998	0	1,340	2,100	2,814	0.321
1999	0	1,340	2,100	2,814	0.321
2000	0	1,340	2,100	2,814	0.321
2001	0	1,340	2,100	2,814	0.321
2002	0	1,340	2,100	2,814	0.321
2003	0	1,340	2,100	2,814	0.321
2004	0	1,340	2,100	2,814	0.321
Electricity Savings Since Start of Program:				59,634	MWh

RESIDENTIAL EFFICIENCY STANDARDS**MULTIFAMILY BUILDINGS ADDING ELECTRIC HEAT
UNDER THE RESIDENTIAL EFFICIENCY STANDARDS ⁽¹⁾**

Year	Duplex-Fourplex		Apts. (>4 units)		Total Multifamily		Cumulative	
	Bldgs	Units	Bldgs	Units	Bldgs	Units	Bldgs	Units
1981	11	19	6	142	17	161	17	161
1982	41	74	14	231	55	305	72	466
1983	17	35	3	47	20	82	92	548
1984	11	19	8	176	19	195	111	743
1985	7	16	6	167	13	183	124	926
1986	11	25	6	244	17	269	141	1,195
1987	6	10	0	0	6	10	147	1,205
1988	1	2	1	23	2	25	149	1,230
1989	1	2	1	60	2	62	151	1,292
1990	1	3	0	0	1	3	152	1,295
1991	3	7	0	0	3	7	155	1,302
1992	2	5	0	0	2	5	157	1,307
1993	1	2	0	0	1	2	158	1,309
1994-2004	0	0	0	0	0	0	158	1,309
Total	113	219	45	1,090	158	1,309	158	1,309

RESIDENTIAL EFFICIENCY STANDARDS

Program Expenditures

Program expenditures from 1981 through 1995 totaled \$440,286. The cost of monitoring new or enlarged electric service requests continues, although the number of buildings required to meet the conditions of Section 5.1 has dwindled since 1982.

PROGRAM EXPENDITURES FOR THE RESIDENTIAL EFFICIENCY STANDARDS (3)

Year	Expenditures
1981	\$21,672
1982	35,862
1983	13,104
1984	21,644
1985	25,400
1986	25,436
1987	44,470
1988	38,294
1989	39,842
1990	31,389
1991	22,519
1992	29,412
1993	28,719
1994	44,663
1995	51,344
1996-2004	0
Total	\$473,770

Notes

- Participants for 1981-1984 are documented in the *Update on the Residential Efficiency Standards* (March 1985). The number of customers complying with the Residential Efficiency Standards was obtained from City Light staff in the Customer Engineering Section, North and South Electrical Service Centers. Staff completed the "New/Enlarged Service for Space Heat in Existing Structures" form for each customer who complies with the 5.1 standards. Figures for 1985-1995 are taken from the Evaluation Unit's RES database based on these forms.

From 1982 to 1988, the Customer Assistance Section, Customer and Commercial Services Division, compiled comparable reports on space heat load added. During those seven years, a total of 1,441 single-family homes met the electric service connection requirements: 1,019 through the residential efficiency standards and 422 through the Seattle Energy Code. Another 667 single-family homes were exempted from the requirements, while 1,027 homes added space heat without increasing the service panel size. Among multiplex and multifamily buildings during this seven year period, 2,699 units met the electric service connection requirements: 1,065 through the residential efficiency standards and 1,634 through the Seattle Energy Code.

RESIDENTIAL EFFICIENCY STANDARDS

2. Energy savings calculations are documented in *Seattle City Light's Residential Efficiency Requirements: The First 18 Months* (March 1983). Energy savings calculations are for single-family affected customers only.

First year energy savings from new participants completing work in each year were: 494 MWh (1981); 760 MWh (1982); 344 MWh (1983); 319 MWh (1984); 242 MWh (1985); 168 MWh (1986); 183 MWh (1987); 139 MWh (1988); 63 MWh (1989); 29 MWh (1990); 23 MWh (1991); 11 MWh (1992); 15 MWh (1993); 19 MWh (1994); and 6 MWh (1995).

3. Expenditures for 1981 and 1982 are estimated to be \$86 per building based on findings in *Seattle City Light's Residential Efficiency Requirements: The First 18 Months* (March 1983). The 1983-1990 data are from year-end Cost Ledger Reports for Work Order No. 71134-01. The cost data for 1991 through 1995 are from the Seattle Financial Management System for the same Work Order No.

Administrative costs for 1993 do not include a new A&G overhead charge (begun in April 1993) for utility administrative and general expenses. This charge distributes departmental administrative and general expenses, including nonprogrammatic labor and expenses, to individual conservation programs in proportion to programmatic labor hours.

RESIDENTIAL INSULATION PROGRAM

Description

The Residential Insulation Program was a pilot program that offered six percent (6%) interest loans to customers with full and partial electric heat, to finance attic insulation (R-19) and under-floor insulation (R-11). This program ended in 1980 and was replaced by the *HELP* (1981-1994), *Warm Home* (1994-1997), and *Neighborhood Power Weatherization* (1997-) programs.

Eligible Population

This program served single-family residences having full and partial electric space heat.

Lifetime of Conservation Measures Installed: 30 years

Electricity Savings

The average home that participated in the Residential Insulation Program saves about 1,900 kilowatt-hours (kWh) per year. These savings represent 10% of the typical electrically-heated single-family home's energy use (19,580 kWh in 1990).

Since 1978 the Residential Insulation Program has saved 23,806 megawatt-hours (MWh). In 2004 the energy savings from cumulative (1979-1980) participants were 939 MWh. The load reduction in 2004 due to this program was 0.107 average megawatts (aMW).

RESIDENTIAL INSULATION PROGRAM**ELECTRICITY SAVINGS FOR THE RESIDENTIAL INSULATION PROGRAM**

Year	Participants by Year	Cumulative Participants	kWh Savings per Participant (1)	MWh Savings in Year (2)	Avg. MW Load Reduction in Year
1978	0	0	0	0	0.000
1979	174	174	1,900	331	0.038
1980	320	494	1,900	939	0.107
1981	0	494	1,900	939	0.107
1982	0	494	1,900	939	0.107
1983	0	494	1,900	939	0.107
1984	0	494	1,900	939	0.107
1985	0	494	1,900	939	0.107
1986	0	494	1,900	939	0.107
1987	0	494	1,900	939	0.107
1988	0	494	1,900	939	0.107
1989	0	494	1,900	939	0.107
1990	0	494	1,900	939	0.107
1991	0	494	1,900	939	0.107
1992	0	494	1,900	939	0.107
1993	0	494	1,900	939	0.107
1994	0	494	1,900	939	0.107
1995	0	494	1,900	939	0.107
1996	0	494	1,900	939	0.107
1997	0	494	1,900	939	0.107
1998	0	494	1,900	939	0.107
1999	0	494	1,900	939	0.107
2000	0	494	1,900	939	0.107
2001	0	494	1,900	939	0.107
2002	0	494	1,900	939	0.107
2003	0	494	1,900	939	0.107
2004	0	494	1,900	939	0.107
Electricity Savings Since Start of Program:				23,806	MWh

RESIDENTIAL INSULATION PROGRAM

Program Expenditures

The program expenditures from 1978 through 1980 totaled \$230,661. This represents the cost to the utility, and not the total cost of the resource. There was no outside funding receiving for this program.

PROGRAM EXPENDITURES FOR THE RESIDENTIAL INSULATION PROGRAM ⁽³⁾

<i>Year</i>	<i>Expenditures</i>
1978	\$23,600
1979	88,500
1980	118,561
1981-2004	0
Total	\$230,661

Notes

1. Energy savings calculations are documented in the *Evaluation of Seattle City Light's Residential Insulation Program* (February 1981). Only customers with full-electric heat saved energy.
2. After 1980 the program was discontinued, so the later savings shown represent continuing savings from earlier program participants only.

First year energy savings from new participants completing work in each year were: 331 MWh (1979); and 608 MWh (1980).
3. Expenditures for this program for 1978-1980 are documented in the *Evaluation of Seattle City Light's Residential Insulation Program* (February 1981). Loan processing costs ceased after 1980 for this program.

WATER HEATER REBATE PROGRAM

Description

Rebates were offered to residential customers who purchased qualifying energy-efficient electric water heaters which exceeded current federal energy efficiency standards, installed thermal traps and bottom boards, and set tanks at 130°F or lower. Originally rebates were \$70 or \$100 per tank, but were lowered to \$50 in May 1986. The program was discontinued in May 1990 when changes in federal efficiency standards superseded the requirements of the program. Since then, the Energy Efficient Water Heater Rebate Program began in March 1992 to promote water heaters exceeding the new federal standards.

Eligible Population

The Water Heater Rebate Program (*WHRP*) served customers, residing in single-family and multiplex (two- to four-unit) homes, who were replacing electric water heaters with energy-efficient ones. Approximately 8,000 residential customers replace their electric water heaters each year.

Lifetime of Conservation Measures Installed: 16 years⁽¹⁾

Electricity Savings

The average participant receiving a Water Heater Rebate Program incentive saves about 400 kilowatt-hours (kWh) per year. These savings represent three percent (3%) of the typical electricity use in a single-family home with electric water heat (14,159 kWh in 1990).

Since 1983 the Water Heater Rebate Program has saved a total of 255,761 megawatt-hours (MWh). In 2004 the energy savings from cumulative (1983-1990) participants were 2,829 MWh. The load reduction in 2004 due to this program was 0.323 average megawatts (aMW).

WATER HEATER REBATE PROGRAM**ELECTRICITY SAVINGS FOR THE WATER HEATER REBATE PROGRAM**

Year	Participants by Year (2)	Cumulative Participants	kWh Savings per Participant (3)	MWh Savings in Year	Avg. MW Load Reduction in Year
1983	2,833	2,833	400	1,133	0.129
1984	5,430	8,263	400	3,305	0.377
1985	6,743	15,006	400	6,002	0.685
1986	6,617	21,623	400	8,649	0.987
1987	5,624	27,247	400	10,899	1.244
1988	5,757	33,004	400	13,202	1.507
1989	5,268	38,272	400	15,309	1.748
1990	1,804	40,076	400	16,030	1.830
1991	0	40,076	400	16,030	1.830
1992	0	40,076	400	16,030	1.830
1993	0	40,076	400	16,030	1.830
1994	0	40,076	400	16,030	1.830
1995	0	40,076	400	16,030	1.830
1996	0	40,076	400	16,030	1.830
1997	0	40,076	400	16,030	1.830
1998	0	40,076	400	14,897	1.701
2000	0	40,076	400	12,725	1.453
2001	0	40,076	400	10,028	1.145
2002	0	40,076	400	7,381	0.843
2003	0	40,076	400	5,132	0.586
2004	0	40,076	400	2,829	0.323
Electricity Savings Since Start of Program:				255,761	MWh

WATER HEATER REBATE PROGRAM

Program Expenditures

The program expenditures from 1983 through 1990 for administration and participant rebates totaled \$4,114,672. This represents the cost to the utility, and not the total resource cost. There was no outside funding for this program.

PROGRAM EXPENDITURES FOR THE WATER HEATER REBATE PROGRAM (4)

<i>Year</i>	<i>Administration</i>	<i>Rebates</i>	<i>Total Expenditures</i>
1983	\$300,559	\$287,181	\$587,740
1984	295,318	511,960	807,278
1985	204,849	675,765	880,614
1986	183,130	465,440	648,570
1987	94,431	305,410	399,841
1988	77,322	282,447	359,769
1989	64,217	249,370	313,587
1990	25,830	91,443	117,273
1991-2004	0	0	0
TOTAL	\$1,245,656	\$2,869,016	\$4,114,672

FINANCIAL EFFICIENCY MEASURES FOR THE WATER HEATER REBATE PROGRAM

<i>Year</i>	<i>Average Administration</i>	<i>Average Rebate</i>	<i>Average Total Expenditure</i>	<i>Administration as a % of Total Expenditures</i>
1983	\$106	\$101	\$207	51.1%
1984	54	94	149	36.6
1985	30	100	131	23.3
1986	28	70	98	28.2
1987	17	54	71	23.6
1988	13	49	62	21.5
1989	12	47	60	20.5
1990	14	51	65	22.0
1991-2004	0	0	0	0.0
Average 1983-1990	\$31	\$72	\$103	30.3%

WATER HEATER REBATE PROGRAM

Notes

1. The lifetime was changed from an initial value of 12 years to 16 years based on findings reported in the *Water Heater Rebate Program 1985 Telephone Survey: Program Market Potential and Reasons for Non-Participation* (December 1985).
2. Participant figures come from *WHRP* Activity Reports, Residential Conservation Section, EMSD.
3. Annual energy savings are from the *Evaluation of the Water Heater Rebate Program* (January 1985).

First year energy savings from new participants completing work in each year were: 1,133 MWh (1983); 2,172 MWh (1984); 2,697 MWh (1985); 2,647 MWh (1986); 2,250 MWh (1987); 2,303 MWh (1988); 2,107 MWh (1989); and 722 MWh (1990).
4. Program expenditures for 1983 are documented in the *Evaluation of the Water Heater Rebate Program* (January 1985). Program costs for 1984-1990 are from City Light MIS reports for Work Order No. 70556 (Budget Item 66).